

POTASH & PHOSPHATE INSTITUTE



P.O. Drawer 2440
Conway, AR 72033-2440
Phone: 501-336-8110
Fax: 501-329-2318
csnyder@ppi-far.org

August 28, 2000

Mr. John Wilson
Mississippi River/Gulf of Mexico Action Plan (4503F)
c/o U. S. Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, D.C. 20460

Dear Mr. Wilson:

On behalf of the Potash and Phosphate Institute, ... in response to the **Notice of Availability and Request for Public Comment**, which was posted in the Federal Register, this letter is sent with four (4) pages of scientific comments on the *Draft Action Plan for Reducing, Mitigating, and Controlling Hypoxia in the Northern Gulf of Mexico*. We have provided scientific comments to the Environmental Protection Agency in the past on the six CENR Topical Reports.

The Potash and Phosphate Institute is a not-for-profit scientific research and education organization, founded in 1935. Our mission has been/is, the advancement of scientific information on nutrient management, specifically phosphorus and potassium management, which is agronomically sound, economically advantageous, and environmentally responsible. We work with Land Grant university research and extension scientists, the USDA Agricultural Research Service, and other public and private research and education institutions to achieve our common goal of an abundant, safe, and nutritious supply of food and fiber. Our Institute is well-recognized by the American Society of Agronomy, the Crop Science Society of America, the Soil Science Society of America, as well as many international scientific organizations.

We request that our comments on the Draft Action Plan be given due consideration by EPA and the Mississippi River/Gulf of Mexico Watershed Nutrient Task Force.

Sincerely,

Clifford S. Snyder, Ph.D.
Midsouth Director

Cc: Chuck Fox, Jim Giattina

Comments on the
Draft Action Plan for Reducing, Mitigating, and Controlling
Hypoxia in the Northern Gulf of Mexico Hypoxia

by

Clifford S. Snyder, Ph.D.
Midsouth Director, Potash and Phosphate Institute

and

Member of Nutrient Enrichment Focus Team, Gulf of Mexico Program

1. We support the general goal of reducing the potential for nitrogen (N) discharges/losses to surface and ground waters in the Mississippi Basin and to the Gulf of Mexico, because it is consistent with the long-term efforts by PPI, and all associated with production agriculture: to increase nutrient use efficiency in making profitable crop yields. However, strict numeric goals for nitrogen discharge reduction will be exceedingly difficult, if not impossible, to achieve from year to year because of the unpredictable and overwhelming effect of weather on water discharge, which is clearly the principal factor affecting nutrient discharge and stratification in the Gulf. The dominance of weather (both in the upper Basin and in the Gulf itself) as the key factor affecting the size and persistence of hypoxia, is evident from the large variation in size of the hypoxic zone from 1998 to 2000: 4800 square miles in 1998, 7728 square miles in 1999, and 1750 square miles in 2000. The inability of the models used to predict the size of the hypoxic zone was essentially admitted to in CENR report #4: "The use of mathematical models for investigating hypoxia in the northern Gulf of Mexico is at an early stage of development". Therefore, we do not agree with, and strongly object to, any numeric nitrogen reduction goal (long-term goal #3) because it is not scientifically defensible. Such a goal is considered arbitrary and capricious.

2. We do not agree with the assertion made in the CENR reports and the Integrated Assessment, upon which the Draft Action Plan is based, that the nation's waters are threatened or impaired by nutrient over-enrichment and that conditions are worsening. The 1996 National Water Quality Inventory reported that of the total surveyed waters, 14 percent of the river miles, 20 percent of lake acres, and 22 percent of estuary square miles were impaired or threatened by nutrients. However, the Government Accounting Office (GAO) reported (GAO/RCED-00-54 Water Quality, March 2000) that only 19 percent of the rivers and streams were assessed, 40 percent of lakes, ponds, and reservoirs, and 72% of the estuaries. The GAO report criticized states and EPA because the water quality conditions reported, using monitoring methods currently employed, are not "statistically projectionable". The GAO report stated, "... monitoring sites that are targeted toward waters with specific characteristics, such as known pollution problems or high levels of public use, result in data that can provide information only on those particular waters that

were monitored”. Most states “use a targeted approach to select monitoring sites and focus monitoring efforts in problem areas or publicly used waters; very few states use a statistical approach”. These facts, and the title of the GAO report -- Water Quality – Key EPA and State Decisions Limited by Inconsistent and Incomplete Data --, underscore the weak knowledge regarding surface water quality and nutrient over-enrichment in the United States. There have been no detrimental ecological and economic impacts from hypoxia to the Gulf of Mexico to date: CENR report #2, Ecological and Economic Consequences of Hypoxia - stated, “The economic assessment based on fisheries data, however, failed to detect effects attributable to hypoxia”. To develop a national strategy to control hypoxia with a focus on nitrogen discharge, using scientifically flawed data, unproven hypotheses, the lack of ecological or economic effects, and scientifically indefensible conclusions about nutrient additions being the primary cause of hypoxia, would be irresponsible at best. We support increased water quality monitoring by states to address local water quality concerns. We strongly object to any attempt by EPA, or inherent in the Draft Action Plan, to control/regulate nutrient discharge anywhere in the Mississippi River Basin based on conditions in the Gulf of Mexico. Authority over local and state waters, and efforts to protect and improve local and state water quality should rest with state water quality authorities and their existing programs. Existing state programs should be given adequate resources and time to positively impact local and state water quality.

3. The data presented by the US. Geological Survey in the CENR reports show an increase in nitrate-N delivery by the Mississippi River to the Gulf since the 1950s. However, since about 1980, the annual discharge of nitrate-N has been relatively constant. No data have been presented in the six CENR Reports, the Integrated Assessment, or the Draft Action Plan which indicate there has been an increase in the concentration of nutrients (i.e. N) within the hypoxic zone in the northern Gulf of Mexico itself. Lack of nutrient concentration data for waters within the hypoxic zone raises questions about the true relationships among the complex factors affecting water quality and hypoxia development. Dissolved oxygen levels in the hypoxic waters, based on a once-per-year peak development assessment, have been reported but nutrient concentration data have not been reported. Further, there are 17 nutrients essential for plant life, and more for animal life. The relationships among all of these essential nutrients within the hypoxic zone, and the growth of phytoplankton and zooplankton in the hypoxic zone, should be more thoroughly investigated before any national nutrient policy is enacted to attempt to control hypoxia in the Gulf of Mexico.

The following research studies clearly illustrate that fertilizer N has not caused a decline in water quality frequently alluded to in the CENR reports, the Integrated Assessment, the Draft Action Plan and other calls for action. These scientific reports come from states which have ranked 1st, second, and 14th in corn production in the United States in recent years.

- Research by Keeney and DeLuca showed that .. *"intensive agricultural activities in 1945 and 1980 to 1990 are the major source of the $\text{NO}_3\text{-N}$ to the river rather than solely N fertilizer. Changes in land management, cropping patterns, and land use are therefore required to markedly lower the $\text{NO}_3\text{-N}$ level of surface water in this basin"*. (Keeney, D. R. and T. H. DeLuca. 1993. Des Moines River Nitrate in Relation to Watershed Agricultural Practices: 1945 versus 1980s. Journal of Environmental Quality 22:267-272)
- Cambardella and others reported their results *"indicate that $\text{NO}_3\text{-N}$ losses to subsurface drainage water occur primarily as a result of asynchronous production and uptake of $\text{NO}_3\text{-N}$ in the soil and the presence of large quantities of potentially mineralizable N in the soil organic matter"*. (Cambardella, C. A., T. B. Moorman, D. J. Jaynes, J. L. Hatfield, T. B. Parkin, W. W. Simpkins, and D. L. Karlen. 1999. Water Quality in Walnut Creek Watershed: Nitrate-Nitrogen in Soils, Subsurface Drainage Water, and Shallow Groundwater. Journal of Environmental Quality 28:25-34.)
- Thomas and others resampled streams in Kentucky in 1989-1990, which had been monitored in 1971-1972, and reported .. *"the use of fertilizer N in Kentucky has nearly doubled and fertilizer phosphate use has increased slightly. Nevertheless, phosphate contents of these streams averaged somewhat lower than they did 18 years ago and $\text{NO}_3\text{-N}$ was almost exactly the same. Only one watershed had changed appreciably in land use; a subdivision had been built and equipped with a sewage treatment plant that drains into one of the creeks. Samples taken above and below the sewage effluent demonstrated the strong effect of the subdivision on both NO_3 and PO_4 in the water."* (Thomas, G. W., G. R. Haszler, and J. D. Crutchfield. 1992. Nitrate-Nitrogen and phosphate-Phosphorus in Seven Kentucky Streams Draining Small Agricultural Watersheds: Eighteen Years Later. Journal of environmental Quality 21:147-150)
- A recent Illinois State Water Survey publication reported: *"Expansion of population, industry and agriculture changed the N cycle in Illinois. The disposal of large amounts of organic waste material and N directly into the rivers and streams, and the transfer of large amounts of organic material and N from agricultural lands to rivers and streams, caused the amount of N, especially organic-N and $\text{NH}_4\text{-N}$, to increase dramatically in the Illinois River."* ***"Since the mid-20th century, the Illinois River has been greatly cleansed. The input of organic material and N has decreased, the concentration of dissolved oxygen has increased, and the concentration of total nitrogen (TN) has decreased by about 50 percent. The measured concentration of TN in the lower Illinois River in the 1890s was only about 25 percent lower than it is today.; and the difference in N concentration becomes minimal or is reversed when plankton and differences in flow rates and methods of measurement are considered."*** *"As part of this cleansing process, the concentration of $\text{NO}_3\text{-N}$ in the Lower Illinois River initially increased, reaching a peak of about 6.2 mg $\text{NO}_3\text{-N/L}$ in 1967-1971, but it subsequently decreased. Today, the concentration of $\text{NO}_3\text{-N}$ in the Lower Illinois River is the same as it was around 1960, i.e., about 3.8 mg $\text{NO}_3\text{-N/L}$. These data, combined with the fact that N-fertilizer use continued to increase rapidly from 1970 to the 1980s, reveal the lack of a consistent relationship between N-fertilizer use*

and N concentration in the Illinois River. " (Krug, E. C. and D. Winstanley. 2000. A Contribution to the Characterization of Illinois Reference/Background Conditions for Setting Nitrogen Criteria for Surface Waters in Illinois. Contract Report 2000-08. June 2000)

4. The Action Plan does not include any cost estimates associated with a national effort to reduce nitrogen discharge. A lack of an accurate assessment of costs, coupled with a lack of a prediction of any ecological or economic benefits, as stated above, sends strong warning signals to the public that unsound policy and regulation are being developed and promoted. American agriculture can ill-afford unwarranted nutrient policy and regulation which further threatens our ability to compete in the global market and which may imperil our national food security.

5. Any potential actions resulting from the Draft Action Plan should :

- target priority watersheds, identified by states as being impaired or threatened by nonpoint source nutrient discharge.
- be voluntary, incentive-based approaches for reducing nutrient discharge from nonpoint sources.
- be coordinated by Sub-basin (watershed) committees involving members of both the public and private sector in implementation.
- provide agricultural producer and landowner assistance at the onset (NOT several years after initiation of action, as currently proposed in the Draft Action Plan, item 8, under short-term actions).
- rely on a phased-in approach, allowing sufficient time (10+ years) for changes to take effect.
- be subject to at least a 5-year review and renewal process. This will support the "Adaptive Management" approach suggested in the Draft Action Plan.